

WHAT IS CLAIMED IS:

1. A beverage bottling plant for filling bottles with a liquid beverage filling material, said beverage bottling plant comprising:

a filling machine configured to fill empty bottles with liquid beverage filling material;

said beverage filling machine comprising a plurality of beverage filling positions, each beverage filling position comprising a beverage filling device for filling bottles with liquid beverage filling material;

said filling devices comprising apparatus configured to introduce a predetermined flow of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material;

said apparatus configured to introduce a predetermined flow of liquid beverage filling material comprising apparatus configured to terminate the filling of beverage bottles upon liquid beverage filling material reaching said substantially predetermined level in bottles;

a conveyer arrangement configured and disposed to move empty bottles to said filling machine;

a closing station configured to close filled bottles;

a conveyer arrangement configured and disposed to transfer filled bottles from said filling machine to said closing station;

a labelling station configured and disposed to label filled bottles with a label;

a conveyer arrangement configured and disposed to transfer closed bottles from said closing station to said labelling station;

said labelling station comprising:

a conveyer arrangement configured and disposed to move

closed bottles within said labelling station;

a label storage magazine configured to hold a plurality of single-sheet labels in a stacked condition;

apparatus, with label grippers, configured and disposed to extract labels from said label storage magazine and to directly apply an extracted label on a filled, closed bottle to be labelled;

apparatus configured and disposed to directly heat a label, prior to finally applying the label on a filled, closed bottle, thus at least to assist in securing an applied label to a filled, closed bottle;

said label grippers being configured and disposed to grip an extracted label and to release a gripped label to thus permit a label to be applied to a filled, closed bottle;

apparatus configured and disposed to press and to smooth a label to a bottle; and

a conveyer arrangement configured and disposed to remove labelled bottles from said labelling station.

2. The bottling plant according to claim 1, comprising all of: (A), (B), (C), (D), (E), (F), and (G), wherein (A), (B), (C), (D), (E), (F), and (G) comprise:

(A) said heating apparatus to heat a label comprises at least one of: a heat radiator, a heating wire, a heated-air blower, an arrangement configured to produce a light beam, an arrangement configured to produce an infrared beam, an arrangement configured to produce an ultraviolet beam, an arrangement to produce microwaves, an arrangement to produce a laser beam, and an arrangement to

produce ultrasound waves;

(B) said label grippers comprise mechanically actuatable label grippers;

(C) control apparatus for control operation of said labelling station;

(D) apparatus configured and disposed to produce a vacuum;
said vacuum producing apparatus is configured and disposed to permit a label removed from said label storage magazine to be gripped by said label grippers;

(E) said apparatus, with label grippers, configured and disposed to extract a label from said label storage magazine and to apply an extracted label comprises:

a first structure;

a second structure;

said first structure is configured to extract a label from said label storage magazine and to move an extracted label to said second structure;

said label grippers are mounted on said second structure;
and

each of said label grippers is configured to grip a label moved by said first structure and to release a gripped label to permit a label to be secured to a container;

(F) said apparatus, with label grippers, configured and disposed to extract a label from said label storage magazine and to apply an extracted label comprises:

a first structure;

a second structure;

said first structure has a central longitudinal axis;
said first structure is configured to rotate about said
central longitudinal axis in a substantially circular path;
said second structure has a central longitudinal axis;
said second structure is configured to rotate about said
central longitudinal axis of said second structure in a
substantially circular path; and

said heating apparatus is disposed adjacent at least one
of: said substantially circular path of said first structure, and
said substantially circular path of said second structure, to
permit heating of a label having a composition on a backside
thereof; and

(G) at least one of: (i) and (ii), wherein (i) and (ii) comprise:

(i) an arrangement configured and disposed to heat said
label grippers; and

(ii) an arrangement configured and disposed to cool said
label grippers.

3. The bottling plant according to claim 1, comprising at least
one of: (A), (B), (C), (D), (E), (F), and (G), wherein (A), (B), (C), (D),
(E), (F), and (G) comprise:

(A) said heating apparatus to heat a label comprises at least
one of: a heat radiator, a heating wire, a heated-air blower, an
arrangement configured to produce a light beam, an arrangement
configured to produce an infrared beam, an arrangement configured to
produce an ultraviolet beam, an arrangement to produce microwaves,
an arrangement to produce a laser beam, and an arrangement to

produce ultrasound waves;

(B) said label grippers comprise mechanically actuatable label grippers;

(C) control apparatus for control operation of said labelling station;

(D) apparatus configured and disposed to produce a vacuum;
said vacuum producing apparatus is configured and disposed to permit a label removed from said label storage magazine to be gripped by said label grippers;

(E) said apparatus, with label grippers, configured and disposed to extract a label from said label storage magazine and to apply an extracted label comprises:

a first structure;

a second structure;

said first structure is configured to extract a label from said label storage magazine and to move an extracted label to said second structure;

said label grippers are mounted on said second structure;
and

each of said label grippers is configured to grip a label moved by said first structure and to release a gripped label to permit a label to be secured to a container;

(F) said apparatus, with label grippers, configured and disposed to extract a label from said label storage magazine and to apply an extracted label comprises:

a first structure;

a second structure;

said first structure has a central longitudinal axis;
said first structure is configured to rotate about said
central longitudinal axis in a substantially circular path;
said second structure has a central longitudinal axis;
said second structure is configured to rotate about said
central longitudinal axis of said second structure in a
substantially circular path; and

said heating apparatus is disposed adjacent at least one
of: said substantially circular path of said first structure, and
said substantially circular path of said second structure, to
permit heating of a label having a composition on a backside
thereof; and

(G) at least one of: (i) and (ii), wherein (i) and (ii) comprise:

(i) an arrangement configured and disposed to heat said
label grippers; and

(ii) an arrangement configured and disposed to cool said
label grippers.

4. A labelling station for labelling a container, said labelling
station comprising:

a moving arrangement configured and disposed to move
containers by said labelling station;

a label storage magazine;

apparatus, with at least one label gripper, configured and
disposed to extract a label from said label storage magazine and to
apply a label on a container to be labelled; and

apparatus configured and disposed to directly heat a label, prior

to finally securing a label on a container, thus at least to assist in securing a label to a container;

said at least one label gripper being configured and disposed to grip a label and to release a gripped label to permit a label to be secured to a container.

5. The labelling station according to Claim 4, wherein:

said label storage magazine is configured and disposed to store labels having a substance on a backside thereof to permit a label to be secured to a container.

6. The labelling station according to Claim 5, wherein:

said heating apparatus to heat a label comprises at least one of: a heat radiator, a heating wire, a heated-air blower, an arrangement configured to produce a light beam, an arrangement configured to produce an infrared beam, an arrangement configured to produce an ultraviolet beam, an arrangement to produce microwaves, an arrangement to produce a laser beam, an arrangement to produce ultrasound waves.

7. The labelling station according to claim 6, wherein:

said at least one label gripper comprises a mechanically actuatable label gripper.

8. The labelling station according to claim 7, comprising:
control apparatus for control operation of said labelling station.

9. The labelling station according to claim 8, comprising:
apparatus configured and disposed to produce a vacuum;
said vacuum producing apparatus is configured and disposed to permit a label removed from said label storage magazine to be gripped by said at least one label gripper.

10. The labelling station according to claim 9, wherein:
said apparatus, with at least one label gripper, configured and disposed to extract a label from said label storage magazine and to apply an extracted label, comprises:
a first structure;
a second structure;
said first structure is configured to extract a label from said label storage magazine and to move an extracted label to said second structure;
said at least one label gripper is mounted on said second structure;
said at least one label gripper is configured to grip a label moved by said first structure and to release a gripped label to permit a label to be secured to a container.

11. The labelling station according to claim 10, wherein:
said first structure has a central longitudinal axis;
said first structure is configured to rotate about said central longitudinal axis in a substantially circular path;
said second structure has a central longitudinal axis;
said second structure is configured to rotate about said central

longitudinal axis of said second structure in a substantially circular path; and

said heating apparatus is disposed adjacent at least one of: said substantially circular path of said first structure, and said substantially circular path of said second structure, to permit heating of a label having an adhesive on a backside thereof.

12. The labelling station according to claim 11, comprising:
at least one of: (i) and (ii), wherein (i) and (ii) comprise:

(i) an arrangement configured and disposed to heat said at least one label gripper; and

(ii) an arrangement configured and disposed to cool said at least one label gripper.

13. A method of operating a labelling station for labelling a container, said labelling station comprising:

a moving arrangement configured and disposed to move containers by said labelling station;

a label storage magazine;

apparatus, with at least one label gripper, configured and disposed to extract a label from said label storage magazine and to apply a label on a container to be labelled; and

apparatus configured and disposed to directly heat a label, prior to finally securing a label on a container, thus at least to assist in securing a label to a container;

said at least one label gripper being configured and disposed to grip a label and to release a gripped label to permit a label to be

secured to a container;

said method comprising the steps of:

removing a label from said label storage magazine;

applying a removed label, with said apparatus configured and disposed to extract a label from said label storage magazine, on a container to be labelled;

gripping a label with said at least one label gripper;

heating a label with said heating apparatus, prior to finally securing a label on a container, thus at least to assist in securing a label to a container; and

releasing a gripped label from said at least one label gripper to thus permit a label to be secured to a container.

14. The method of operating a labelling station according to claim 13, wherein:

said label storage magazine is configured and disposed to store labels having a heat-activatable adhesive on a backside thereof to permit a label to be secured to a container;

said method comprising the steps of:

storing labels having a heat-activatable adhesive on a backside thereof in said label storage magazine;

said step of removing a label from said label storage magazine comprises removing a label having a heat-activatable adhesive on a backside thereof;

said step of applying a removed label, with said apparatus configured and disposed to extract a label from said label storage magazine, on a container to be labelled, comprises

applying a label having a heated adhesive on a backside thereof on a container to be labelled;

said step of gripping a label with said at least one label gripper comprises gripping a label having a heat-activatable adhesive on a backside thereof;

said step of heating a label with said heating apparatus, prior to finally securing a label on a container, thus at least to assist in securing a label to a container, comprises heating a label having a heat-activatable adhesive on a backside thereof; and

said step of releasing a gripped label from said at least one label gripper to thus permit a label to be secured to a container, comprises releasing a label having a heat-activatable adhesive on a backside thereof.

15. The method of operating a labelling station according to Claim 14, wherein:

said heating apparatus to heat a label comprises at least one of: a heat radiator, a heating wire, a heated-air blower, an arrangement configured to produce a light beam, an arrangement configured to produce an infrared beam, an arrangement configured to produce an ultraviolet beam, an arrangement to produce microwaves, an arrangement to produce a laser beam, and an arrangement to produce ultrasound waves;

said method comprising the step of:

said heating step comprises heating a label having a heat-activatable adhesive on a backside thereof with said heating

apparatus.

16. The method of operating a labelling station according to claim 15, wherein:

said at least one label gripper comprises a mechanically actuatable label gripper.

17. The method of operating a labelling station according to claim 16, wherein said labelling station comprises:

control apparatus for control operation of said labelling station;
said method comprising the step of:

controlling said control apparatus;

said step of controlling said control apparatus comprises
controlling said heating apparatus.

18. The method of operating a labelling station according to claim 17, wherein said labelling station comprises:

apparatus configured and disposed to produce a vacuum;

said vacuum producing apparatus is configured and disposed to permit a label removed from said label storage magazine to be gripped by said at least one label gripper;

said method comprising the steps of:

generating a vacuum sufficient to permit a label removed from said label storage magazine to be gripped by said at least one gripper; and

said step of removing a label from said storage magazine comprises removing a label by a vacuum from said label storage

magazine.

19. The method of operating a labelling station according to claim 18, wherein:

said apparatus, with at least one label gripper, configured and disposed to extract a label from said label storage magazine and to apply an extracted label, comprises:

a first structure;

a second structure;

said first structure is configured to extract a label from said label storage magazine and to move an extracted label to said second structure;

said at least one label gripper is mounted on said second structure;

said at least one label gripper is configured to grip a label moved by said first structure and to release a gripped label to permit a label to be secured to a container;

said method comprising the steps of:

said step of removing a label from said label storage magazine comprises removing a extracting a label from said label storage magazine with said first structure and moving an extracted label to said second structure; and

said step of gripping a label with said at least one label gripper comprises gripping a label, moved by said first structure, with said at least one label gripper and releasing a gripped label from said at least one label gripper to thus permit a label to be secured to a container.

20. The method of operating a labelling station according to claim 19, comprising at least one of: (A) and (B), wherein (A) and (B) comprise:

(A) said first structure has a central longitudinal axis;
said first structure is configured to rotate about said central longitudinal axis in a substantially circular path;
said second structure has a central longitudinal axis;
said second structure is configured to rotate about said central longitudinal axis of said second structure in a substantially circular path; and

said heating apparatus is disposed adjacent at least one of: said substantially circular path of said first structure, and said substantially circular path of said second structure, to permit heating of a label having a heat-activatable adhesive on a backside thereof; and

(B) said labelling station comprises at least one of: (i) and (ii), wherein (i) and (ii) comprise:

(I) an arrangement configured and disposed to heat said at least one label gripper; and

(II) an arrangement configured and disposed to cool said at least one label gripper;

said method comprising at least one of the steps of: (i), (ii), and (iii), wherein (i), (ii), and (iii.) comprise:

(i) heating a label having a heat-activatable adhesive on a backside thereof to a temperature to activate a heat-activatable adhesive on a backside thereof of a label, thus at least to assist in securing a label to a container;

- (ii) heating said at least one label gripper; and
- (iii) cooling said at least one label gripper.